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## TECHNICAL BULLETIN

### STAINLESS STEEL

The standard for stainless steel has been what is called the 300 Series, Chromium-Nickel type or 18-8 stainless steel. The 18-8 refers to the chemical components of chromium (18%) and nickel (8%). The addition of chromium allows for the creation of a chromium oxide layer on the surface of the material. It is this oxide layer that protects the material from corrosion thus forming a 'Stainless Steel'. Nickel does many things for the mechanical and physical properties of the alloy, including increasing both yield and tensile strength and also the material hardness.

Because of a shortage of nickel during the Korean Crisis a new series of stainless steel was developed – Series 200. This group of stainless steels is referred to as the Chromium-Manganese-Nickel type. In the chemical composition of this material, nickel is replaced with manganese at a ratio of 2% for each percent of nickel replaced.

Manganese is more readily available and when combined with the reduced nickel content increases both the tensile and yield strength along with the hardness. This chemistry also maintains the excellent ductility and superior creep strength of the 300 Series stainless it was created to replace.

The 200 Series grades, 201 and 204, both have very similar properties to the 300 Series grades. They can and are being used where one or more of the following properties are important:

- Corrosion resistance
- Prevention of product contamination
- Oxidation resistance
- Appearance
- Ease of cleaning
- Ease of fabrication
- High strength with low weight

Until recently the stainless steel market has not readily accepted the 200 Series stainless steels. This was due mainly to the popularity of the commodity 300 Series grades and the lack of availability of the 200 Series grades. Current world shortages of nickel have brought the attention back to the 200 series materials as replacements for 300 series stainless steel in conveyor belts, dairy equipment, food processing industries, cooking utensils, along with kitchen and hospital equipment.

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